



**UCSC**

**University of Colombo, Sri Lanka**

*University of Colombo School of Computing*



**DEGREE OF BACHELOR OF INFORMATION TECHNOLOGY  
(EXTERNAL)**

Academic Year 2024 — 3<sup>rd</sup> Year Examination — Semester 6

**EN6106 — Emerging Topics in Information Technology**

*Multiple Choice Question Paper*

(1 Hour)

**Important Instructions**

- The duration of the paper is **1 Hour**.
- The medium of instructions and questions is English.
- This paper has **20 MCQ questions** on **6 pages**. Answer **all** questions.
- Each question will have **5 (five)** choices with **ONE OR MORE** correct answers.
- There will be a penalty for incorrect responses to discourage guessing.
- The mark given for a question will vary from -1 (All the incorrect choices are marked & no correct choices are marked) to +1 (All the correct choices are marked & no incorrect choices are marked). However, **the minimum mark per question would be zero**.
- Answers should be marked on the **special answer sheet** provided.
- Note that questions appear on both sides of the paper. If a page or part of a page is not printed, please inform the supervisor/invigilator immediately.
- Mark the correct choices on the question paper first and then transfer them to the given answer sheet which will be machine marked. **Please completely read and follow the instructions given on the other side of the answer sheet before you shade your correct choices.**
- Any electronic device capable of storing and retrieving text, including electronic dictionaries, smartwatches, and mobile phones, is not allowed.
- Calculators are **not** allowed.
- *All Rights Reserved*. This question paper can NOT be used without proper permission from the University of Colombo School of Computing.

1) What is/are key characteristic(s) of monolithic architecture?

- (a) Independent deployment of services.
- (b) Fine-grained services.
- (c) All functionalities in a single application.
- (d) Easy to scale horizontally
- (e) Decentralized governance.

2) Which characteristics best define microservices architecture?

- (a) Independent deployment
- (b) Fine-grained services
- (c) Centralized governance
- (d) Services run in their own process
- (e) Shared database

3) what is/are synchronous messaging protocols used in microservices?

- (a) REST
- (b) Thrift
- (c) MQTT
- (d) AMQP
- (e) STOMP

4) What is/are the style/s of inter-service communication in microservices?

- (a) Message Broker
- (b) Centralized ESB
- (c) Shared memory
- (d) Point-to-point
- (e) API-Gateway

5) Which aspect/s is/are typically included in microservice governance?

- (a) No centralized design-time governance
- (b) Services make their own design decisions
- (c) Runtime governance at API-Gateway
- (d) Centralized control over all services
- (e) Shared service logic

6) What is/are the benefits of implementing data standardization?

- (a) Ensure consistent units
- (b) Normalize formats
- (c) Improve data quality
- (d) Add random noise
- (e) Match presentation styles

7) What is/are the components of a typical data pipeline architecture?

- (a) Sources
- (b) Joins
- (c) Extraction
- (d) Standardization
- (e) Decoration

8) What type of data can be analyzed using NumPy?

- (a) Numerical data
- (b) Arrays
- (c) Text formatting
- (d) Image formatting
- (e) Mathematical operations

9) What are the two (02) main types of data used in data analytics?

- (a) Raw data
- (b) Structured data
- (c) Unstructured data
- (d) Clean data
- (c) Processed data

10) What are the strengths of machine intelligence over humans?

- (a) Speed
- (b) Alertness
- (c) Emotional intelligence
- (d) Simultaneous activities
- (e) Creativity

11) What is/are the characteristic(s) of the Turing Paradigm?

- (a) Machines must mimic human behavior
- (b) Machines must outperform humans
- (c) Machines must convince humans they are not machines
- (d) Machines must be self-aware
- (e) Machines must pass a visual test

12) Which paradigms emerged from the initial AI dilemma?

- (a) Connectionist Paradigm
- (b) Evolutionary Paradigm
- (c) Symbolic Paradigm
- (d) Bayesian Paradigm
- (e) Deterministic Paradigm

13) What are the benefits of using systematic Social Network Analysis over qualitative methods?

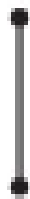
- (a) Objectivity
- (b) Replicability
- (c) Artistic expression
- (d) Broader applicability
- (e) Manual sketching

14) Which of the following statements accurately describe/s *Eigenvector Centrality*?

- I. Nodes with high eigenvector centrality are connected to other important nodes.
- II. Measures how close a node is to all other nodes in the network
- III. It considers both the number of connections a node has and the importance of those connections.

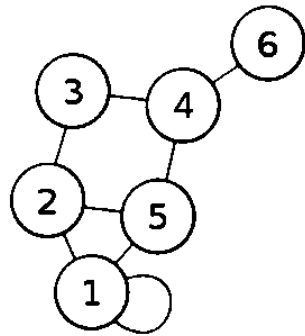
- (a) I only
- (b) II only
- (c) I and II only
- (d) I and III only
- (e) All I, II, and III

15) What kind(s) of *graph data structure* is/are shown in the following figure?



- (a) Undirected graph
- (b) Biconnected Graph
- (c) Multigraph
- (d) Complete Graph
- (e) Singleton graph

16) Which *adjacency matrix* shows the correct representation of the following graph?



(a)

	1	2	3	4	5	6
1	2	1	0	0	1	0
2	1	0	1	0	1	0
3	0	1	0	1	0	0
4	0	0	2	0	1	1
5	1	1	0	0	0	0
6	0	0	0	1	0	0

(b)

	1	2	3	4	5	6
1	2	1	0	0	1	0
2	1	0	1	0	1	0
3	0	1	0	1	0	0
4	0	0	2	0	1	1
5	1	0	0	1	0	0
6	0	0	0	1	0	0

(c)

	1	2	3	4	5	6
1	1	1	0	0	0	0
2	1	0	1	1	0	0
3	0	0	1	1	0	0
4	1	0	0	0	0	0
5	0	0	0	0	0	1
6	0	0	0	0	0	2

(d)

	1	2	3	4	5	6
1	2	1	0	0	1	0
2	1	0	1	0	1	0
3	0	1	0	1	0	0
4	1	0	1	0	1	1
5	1	1	0	1	0	0
6	0	0	0	1	0	1

(e)

	1	2	3	4	5	6
1	2	1	0	0	1	0
2	1	0	1	0	1	0
3	0	1	0	1	0	0
4	0	0	1	0	1	1
5	1	1	0	1	0	0
6	0	0	0	1	0	0

17) What are the phases involved in a digital forensic investigation?

- (a) Identification
- (b) Collection
- (c) Examination
- (d) Litigation
- (e) Deployment

18) What role does the chain of custody play in evidence management?

- (a) Track evidence handling
- (b) Prevent tampering
- (c) Encrypt data
- (d) Ensure admissibility in court
- (e) Generate passwords

19) Which information is essential to include in a chain of custody form?

- (a) Date and time
- (b) Description of evidence
- (c) Evidence encryption key
- (d) Handler's name
- (e) Suspect's confession

20) How does virtualization enhance digital forensic investigations?

- (a) Create virtual environments
- (b) Reduce hardware dependency
- (c) Encrypt data
- (d) Speed up manual analysis
- (e) Test forensic tools

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